LENS ARRANGEMENT WITH FLUID CELL AND PRESCRIPTIVE ELEMENT

CLAIMS

1. A lens arrangement for use in applying a corrective power, comprising:

    a) a fluid lens cell having a chamber formed by first and second lens elements, the chamber being sealed by a seal and containing a transparent fluid, the first and second lens elements being made of a transparent material, one of the first or second lens elements being flexible;

    b) a passage coupled to the fluid lens cell so as to allow communication with the chamber, the passage providing for flow of the fluid therethrough so that the volume of the chamber can be changed;

    c) a rigid third lens element having first and second surfaces that are shaped to provide optical correction, the third lens element being removably coupled to an exterior of the fluid cell so as to be adjacent to the fluid cell and optically aligned with the fluid cell.

2. The lens arrangement of claim 1 wherein the fluid cell is capable of providing a null correction.

3. The lens arrangement of claim 2 wherein the fluid cell provides a null correction when the flexible first or second lens element is unflexed.

4. The lens arrangement of claim 3 wherein at least one of the first or second lens elements comprises a negative lens.

5. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane, the membrane having an edge portion and a center portion, the edge portion being pivotally coupled to an annular member between the first and second lens elements, wherein the center portion of the membrane can flex.

6. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane and the third lens element is adjacent to the membrane, there being a space between the third lens element and the membrane to allow the membrane to flex.

7. The lens arrangement of claim 1 wherein one of the first or second surfaces of the third lens element is spherical and the other of the first or second surfaces is cylindrical.

8. The lens arrangement of claim 1 wherein one of the first or second surfaces of the third lens element is cylindrical, and has a cylindrical axis, the third lens element being rotatable relative to the fluid cell so as to vary relative to the cylindrical axis orientation.

9. The lens arrangement of claim 1 wherein the first and second lens elements each have two surfaces, with at least one of the surfaces of the first, second or third lens elements being coated, shaded or polarized.

10. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane, the membrane having two flat surfaces.

11. The lens arrangement of claim 1 wherein the flexible one of the first or second lens elements comprises a membrane, the membrane having two surfaces, with one of the membrane surfaces being curved.

12. The lens arrangement of claim 1 wherein the third lens element is coupled to the fluid cell independently of the fluid lens seal, wherein the third lens element can be removed from the lens arrangement without disturbing the seal.

13. The lens arrangement of claim 12 wherein the third lens element is rotatably coupled to the fluid lens cell.

14. The lens arrangement of claim 1 wherein:

a) the third lens element comprises a prescription lens;

b) the third lens element is coupled to the fluid cell by way of an adapter which is structured and arranged for receiving the third lens element.

15. The lens arrangement of claim 14 further comprising a frame, wherein the adapter and the fluid cell form a smooth surface for bearing on the nose of a human.

16. A lens arrangement for use in applying a corrective power, comprising:

a) a base having first and second surfaces;

b) a flexible membrane having third and fourth surfaces, the second surface of the base and the third surface of the membrane being adjacent to each other and forming a chamber therebetween, the membrane having an edge portion and a center portion, the edge portion being coupled to the base wherein the center portion can flex;

c) the chamber being sealed and containing a transparent fluid;

d) the base and the membrane being made of transparent materials and forming a fluid cell;

e) a passage providing communication between the chamber and the exterior of the fluid cell so as to allow the amount of fluid within the chamber to be changed;

f) a corrective lens element having fifth and sixth surfaces that are shaped to provide optical correction, the corrective lens

element being removably coupled to the base so as to be adjacent to the fluid cell.

17. The lens arrangement of claim 16 wherein the corrective lens element is rotatably coupled to the base.

18. The lens arrangement of claim 16 wherein one of the fifth or sixth surfaces of the corrective lens element is spherical and the other of the fifth or sixth surfaces is cylindrical.

19. The lens arrangement of claim 16 wherein the corrective lens element is coupled to the base by way of a ring member.

20. The lens arrangement of claim 19 wherein the membrane edge portion being pivotally coupled between the base and the ring member.

21. The lens arrangement of claim 16 wherein the corrective lens element is adjacent to the membrane.

22. The lens arrangement of claim 16 wherein one of the third or fourth surfaces of the membrane is spherical.

23. The lens arrangement of claim 16 wherein the first and second surfaces of the base, the fluid and the third and fourth surfaces of the

membrane form a null correction when the membrane is in an unflexed position.

24. The lens arrangement of claim 23 wherein the base comprises a negative lens.

25. The lens arrangement of claim 16 wherein the base is mounted into an eyewear frame.

26. The lens arrangement of claim 16, wherein:

a) one of the fifth or sixth surfaces of the corrective lens element is spherical;

b) the other of the fifth or sixth surfaces of the corrective lens element is cylindrical, the corrective lens element being rotatably coupled to the base;

c) one of the third and fourth surfaces of the membrane is spherical;

d) the first and second surfaces of the base, the fluid and the third and fourth surfaces of the membrane form a null correction when the membrane is in an unflexed position;

e) the base is mounted into an eyewear frame.

27. An arrangement of lenses, comprising:

a) a first lens and a second lens;

b) each of the first and second lenses comprising a fluid lens cell having a chamber formed by first and second lens elements, the chamber being sealed by a seal and containing a transparent fluid, the first and second lens elements being made of a transparent material, one of the first or second lens elements being flexible;

c) each of the first and second lenses comprising a passage coupled to the fluid lens cell so as to allow communication with the chamber, the passage providing for flow of the fluid therethrough so that the volume of the chamber can be changed;

d) the passage communicating with a fluid pump, the pump being controlled by a controller;

e) one of the first lens controller or the second lens controller selectively controlling one or both of the first lens pump and the second lens pump.

28. The arrangement of lenses of claim 27 wherein each of the first and second lenses comprise a rigid third lens element having first and second surfaces that are shaped to provide optical correction, the third lens elements being removably coupled to an exterior of the fluid cell so as to be adjacent to the fluid cell and optically aligned with the fluid cell.